

Duplicate copy
HANDS: BRAIN: HEART.

A N

A D D R E S S

DELIVERED BEFORE THE

Mass. Charitable Mechanic Association

ON OCCASION OF THEIR

EIGHTH EXHIBITION,

SEPTEMBER 24, 1856.

BY REV. F. D. HUNTINGTON, D. D.

BOSTON:

PRESS OF GEO. C. RAND & AVERY,
NO. 3 CORNHILL.

1856.



342

MANAGERS' OFFICE, FANEUIL HALL,
BOSTON, SEPT. 27, 1856. }

TO PROFESSOR F. D. HUNTINGTON, D. D.

Dear Sir: — In compliance with a vote of the Board of Managers of the Eighth Exhibition of Manufactures and Mechanic Arts, under the auspices of the Massachusetts Charitable Mechanic Association, it is our pleasant duty to communicate to you the thanks of the Board for the interesting and eloquent address delivered before the Association, on the 24th inst., and to request a copy of the same for publication.

Truly yours, &c.

FREDERIC W. LINCOLN, JR. }
JOSEPH M. WIGHTMAN, } *Committee.*
OSMYN BREWSTER, }

CAMBRIDGE, OCT. 20, 1856.

TO MESSRS. F. W. LINCOLN, JR., }
JOSEPH M. WIGHTMAN, } *Committee.*
OSMYN BREWSTER, }

Dear Sirs: — I thank you and your esteemed associates for the kind reception granted to my address. It was a pleasure to me to be brought, in this way, into direct communication with your very honorable and useful institution. My interest in its prosperity will always continue.

With most sincere regard,

Your friend and servant,

F. D. HUNTINGTON.



ADDRESS.

HANDS, Brain, Heart; the three parts of a complete mechanic and a true man; the three grand seats of personal power; the organs of the three supreme human forces: their functions, their relations, their harmony; this is the natural subject.

Why do you gather here, at the close of another successful celebration of particular labors, for an hour of general thought? Why is the celebration itself? There can be but one answer. We call it an Exhibition. But that name does not describe the thing. It is more. It is an educator. The whole scene is a vital, earnest institute of instruction. It is an argument. It is a treatise. It is a poem. It is an illustrated text-book. It is one of the people's quick-witted, extemporized, unencumbered universities. The announcement that went out, two weeks ago, to all the shops and mills, as far as the Ammonusock, the St. John's, the Hudson, and beyond, that the Eighth Exhibition was open, was a school bell, calling every artizan in New England, to come and take a new and larger lesson. Your mechanism does not parade in Faneuil Hall to get itself admired, and flattered, and so to advertise the dealer's stock. It comes on a nobler errand; comes to quicken invention, to stimulate drudgery, to re-inspire routine, to put new illumination into old task-work, to raise the tone of life, to expand civilization, to

finish and edify society. When the first Industrial Exposition was held in Boston, one hundred and three years ago, and three hundred manufacturers made the Common yonder buzz with three hundred spinning-wheels, the relative excitement and curiosity may have been as great as now. But was there as much relative tuition, as much impulsive energy? Amidst these gorgeous Fairs the unceasing problem is, that we have human specimens to send, as imposing, in proportion, as the coaches, and churns, and reapers; that the ratio be kept right between the labor and the laborer; the artificer greater than the splendid fabric he finishes, the engineer superior to the engine, the operative of more significance than the loom, the woman finer than the embroidery; and so to save the workman from sinking into a belittled and skulking subaltern in the glittering show-house he has adorned. To get the right kind of mechanism you must, first of all, get the right kind of a mechanic. You are perpetually interrupted and turned back from the premium and the product to the producer, whom no premium can pay. That may still happen which an old chronicler complains of. "In times past," he says, "men were content to dwell in houses builded of sallow, willow, plum-tree, or elm; but now these are rejected, and nothing but oak any whit regarded. And yet, see the change; for when our houses were builded of willow then had we oaken men; but now that our houses are made of oak, our men are not only become willow, but even, through a Persian delicacy crept in among us, altogether of straw, which is a sore alteration." This, then, is the question. Going from the article to the worker, how to do the most for him, the mechanician, in these three chief elements of his strength—his Hand, his Brain, his Heart.

I. Brain and Heart are separate centres of vital systems; co-ordinate economies of the corporeal estate; each an inde-

pendent organism, with its apparatus and offices; each carrying on its cunning processes; each originating its own complex motions, and maintaining its self-included government; yet both co-operating in a concord of perfect beauty in the Commonwealth of the body. The hand is their common agent — their steward, secretary, marshal, factor, finisher.

Yet, when we look at it mechanically, the hand seems hardly less the seat of an organic system in itself. That, also, is a centralized economy. It is the consummation of a complicated order. For the hand properly begins at the roots of life. It is articulated from the clavicle of the chest. It finds, at the scapula, the nexus of muscles and nerves which bind it back and fasten it vascularly to the brain. So it grows out of the midst of the man, and swings by the efficiency of his imperial will.

Every bone and fibre, from the shoulder-socket on, is tributary to the hand; contemplates it, prophesies it, works it. And when we come to the structure itself, with its frame-work of twenty-nine bones, its hinges and pulleys, its grooves and cords, its levers and screws of unequal lengths, its telegraph and tubes, its solids and liquids, its cushions and painted coverings, we find it the marvellous medium of man's physical commerce with the world.

Here, then, is the point of contact between our human organization and all the mechanisms of science and art. This is the material joint or shackle, where the forces of machinery and of man meet and interlock. The primal and archetypal tool is the human hand; for complexity, for flexibility, for adaptation, for strength, for endurance, for delicacy, for noiseless play, unrivalled and inimitable. It pulls, and grasps, and drags, and picks, and smoothes, and punches, and lifts, and presses, and rubs, and pushes, and wrenches, and tears, and tickles, and folds, and stitches, and buttons, and kneads, and delves, and

scatters, and smites. Will any other tool do so much? Yet, with all this pre-eminence in the aggregate of its qualities, it is limited in respect of them taken one by one. As necessities multiply, man wants more hands, and tougher, and stouter, and longer, than the two that Nature gave him. Mechanism is the effort of this want to supply itself. Mechanism is an extension of the human hand. It is the primitive tool carried out into new sets of links, wheels, cylinders, pivots. Every grist-mill, from that of King Mithridates of Cappadocia, to that of Oliver Evans of Delaware, the threshing machine, the power loom, Archimedes' cranes and Hoe's presses, are only inanimate accessions taken on to our natural constitution, to help out its deficiencies. Cotton cloth was once principally manufactured by the East Indians. But to-day a single hand in Lowell can spin as much cotton in one hour as three thousand Hindoo hands. It is known that the machinery now running in Great Britain can make more cloth in a given time than all the unaided hands of the whole population of the globe without machinery. It took one hundred thousand pairs of Egyptian hands twenty years to erect the great pyramid. One third as many, aided by the steam power now running in England, would raise the same materials to the same height in eighteen hours. In order to achieve these helping offices with the finest effect, mechanism must imitate those special characters, such as compactness, facility, accuracy, adaptedness, compensations between force and velocity, which give the hand its instrumental perfection, and, indeed, make it, in some sense, the divine model for all mechanics. The Indian muslins prove that there is a touch of the Hindoo woman's fingers finer than any possible machine. If you uncover a piano-forte, you find the light unequal levers, from the key-board, traversing the sounding strings, just as the delicate muscles do which yield their quickness to the musician's

fingers, which are named, in anatomy, from that very office, the *fidicinales* of the instrument. The machine that picks has its thumb and finger; the machine that twirls, its wrist.

So, too, a machine that violates any of these manual laws, having too much bulk, or complication, or cost of material to do its own individual work in the best way, at the least cost, is overdone; and it becomes a mechanical rule that excess of elaboration is clumsiness. It is as if the Creator had put fifteen fingers on to each hand. To hit the exact proportion between the tool and the use, is the inventor's problem. The Patent Office at Washington abounds in specimens of these over-wrought designs — contrivances too subtle for convenience — the crude exaggerations of a science exulting in its resources, but not yet ripened into the maturity that likes "too much" no better than "too little," and fits the weapon precisely to the use.

It will be found, too, that the Hand can never be entirely displaced. Things will remain to be done by it that nothing else can do. Hence the need, not only of a sentimental recognition of its dignity, but of a muscular practice in its discipline. Christianity and republicanism together have not yet thoroughly killed out the old fallacy about manual labor, and the false shame of a brown skin. In the broad philosophy which is yet to interpret our life, every faculty and limb will be seen to be ennobled by service. The effeminacy of the Chinese aristocracy, who take pride in letting their nails grow as long as their fingers, as a proof that they never work, creeps into all the nations, and taints them with its pale stupidity. When common sense begins to re-adjust the scale of honors, it will have only to recur to the simple truth just laid down, and to see that the training of the original and most perfect instrument, fastened to our own side, can never be less legitimate or noble than the training of tools which are its copies and assistants. It is

good, amidst the fashionable fastidiousness and daintiness of our modern customs, when so many nice young men dodge behind a dry goods counter, or into the dull decencies of a profession, only to get rid of laying their bones to toil, to let some masculine calling stand forth as a witness of the wholesome law that by the literal sweat of the brow the best of men shall eat their bread; that sweat which moistens the cement that binds the social welfare together. Among all the new clans and lodges, let us be content so long as there is no order of Do-nothings. The time will be when the regular idler, consuming and not producing, shall be felt to be such an insufferable outrage and excrescence on society, that he shall be compelled to make instant apology, at the whipping-post of public opinion, for the presumption of occupying a human organization. You see this change coming about. I look upon it as one of the grand reforms inaugurated by Christian ideas, evidenced and furthered by nothing more signally than by your own public jubilees of handiwork, your royal ovations of industry, your coronations of the genius of labor. You see it also by the politic flatteries which any lazy demagogue, who has objects to carry, in these days, finds it expedient to bestow on what he patronizingly calls "the working classes." Certain talkative gentlemen, following in the wake of Carlyle's reverberating remonstrance, like "flutes and soft recorders" after a roll of indignant thunder, have piped and sung to the age of the "Dignity of labor," "Godlike labor, with the grimed brow and the tough hand," till the "noble army" of laborers, canonized into equal honors with the "noble army of martyrs," but for some intrinsic valor of their own, might have subsided into the complacent and comfortable persuasion that nothing was left for them to do but to vote the party-ticket, be dined the day after election, and lounge on ottomans, and be sprinkled with rose-water, the rest

of life. Now, it seems to me the true way to honor labor and laborers is to put an honest faith first in their capabilities, and then call them to be true to their own order, in their own line. To provoke them, and keep them uneasy, till they have stretched their sinews to more various achievements, is the manliest way to eulogize them. Work will always be the business of the hero or the saint, and a blessing, while God lives, who worketh hitherto; and no device is friendly to the race which brings either a compulsory or a luxurious sloth.

Just at this point crops out one of those solemn social questions, so much more easily settled in the theories of political economists than in the anxieties of hungry families. It is suggested afresh, in some form, by every display like that in yonder halls. Hands and machines come to competition. The contrivance that does the work of a hundred hands threatens to leave the hands idle, and the mouths that match them empty. No general reasoning, no grim logic of "Help yourself if you can," no past experiment, quite suffices to allay this alarm of the people. Combining with natural prejudice and the pride of a self-sufficient conservatism, it disturbs many minds, and does retard, in some places, even the impetuosity of nineteenth century invention. I can myself recall the scene,—indeed, it was less than ten years ago, where, in one of the most intelligent agricultural districts of New England, the neighbors of the venturesome farmer who first bought a horse-rake refused to be convinced by the plainest proofs of its economy, but looked askance at it over the fences as an impertinent piece of agricultural heresy, almost as bad as if the good old parson had shortened his sermon below the regular hour and a quarter, giving them less than the worth of their money in the pew-tax. The old spirit is by no means dead—however effectually you, gentlemen, may be aggressing upon it—which has persecuted the

prophets, and ridiculed the thinkers, and starved the innovators; which, in the old world, has often collected a rabble to mob a new discovery that came with healing on its wings; which forbade Watt to open his instrument shop in Glasgow; which compelled the House of Representatives of the United States, in 1810, to refuse Robert Fulton the use of their Hall to deliver a lecture on steam navigation, on the ground that it was "a visionary scheme;" which sneered at "Fulton's Folly," as it was nicknamed, in Brown's shipyard, at New York; which actually broke the heart of poor William Lee, in the time of James I., driving him, by English indifference, to France, and then, by French bigotry, from Rouen to Paris, where he died in misery, because the world would not let its stockings be made by his stocking-machine; which, in South America, according to Humboldt, instigated the citizens to petition the government against the building of a road among the Andes, lest it should damage the interests of the carriers, who had enjoyed the monopoly of carrying travellers across the mountains in baskets strapped on their backs; which influenced the Swiss peasants, when they saw Rupp constructing the superb slide of Alpnach, for bringing down the pine timber of Mount Pilatus into Lake Lucerne, to accuse his trigonometry of being the inspiration of the devil; which drove the lace manufactory and prosperity out of Nottinghamshire into Devonshire; which, only forty years ago, threw brickbats at a collier in Philadelphia who brought down nine wagon loads of mountain coal to sell, hooting after him as an impostor, that pretended to sell stones for fuel; which trembled all the way from Boston to Albany, when the Western Railroad was about to be laid, with the ludicrous fear that horses would go out of fashion, and have to be shot down in their shoes as a drug; which fretted the Flemish gentleman, who began with commiserating American ignorance, but, after hearing from his

American fellow-traveller a description of Amos Whittemore's card-machine and Thomas Blanchard's lathe, pronounced them impossible, grew angry, and took to sulks, at the impudence of the Yankee who undertook to put off upon him these stories of Gulliver inventions; which drove Hargreaves out of Lancashire for his life, and prompted Laurence Earnshaw to break up his own machine, in a fit of benevolent apprehension, lest he should take bread out of his neighbors' mouths, — when a bold improvement on both their designs by Arkwright gave wages and food to millions of workmen, raised the commerce in cotton from two million pounds a year to a thousand millions of pounds, and poured wealth into the treasury of the nation and the world.

That timid temper, I say, is not exterminated yet; and, therefore, it is one of the beneficent ends of your enterprize to come in as a vindicator and interpreter, in this insane insurrection of Hands against machines; to justify all manner of intellectual originality; to demonstrate the absolute justice of the industrial laws. It is yours to prove that the multiplying of labor-saving machinery can never diminish the means of living; in fact, that labor is not finally saved, but multiplies itself, by and in the machine. The final cause of labor-saving contrivances is to increase labor. This is the eternal paradox of the world's growing civilization. A mechanic is not worthy of his name, who prizes any such piece of workmanship because it releases him from action, or relaxes the necessity of his doing; he will prize it precisely as bringing a means, and a stimulus, and time, for doing more than ever. The several industries of mankind move forward under one harmonious plan. Every legitimate development or production in one favors the others. I know of nothing in the whole history of men more beautiful or more majestic than the certainty of this rule. The illustrations of it are the annals of all the arts. Apart from its own

fascinating interest, it is one of the most splendid proofs of the being and providence of God. It is a more convincing argument for religion than often gets voice from a pulpit. The family of man are under one Father. It is as sure as gravitation, that every fresh mechanism He puts into the world through an ingenious mind, He takes up and makes a part of his unimpeachable goodness. Its inconveniences are local and temporary; its beneficence is cosmopolitan and permanent. It enriches, employs, establishes, equalizes. It creates demands only to satisfy them; it saves expenditure only to scatter it with a wider sweep. A few copyists are, at first, sent adrift by the printing-press; but what an army of fainting operatives that mighty engine nourishes to-day! a stupendous philanthropist of employment, if that were its only function! The sewing-machine may bring a brief embarrassment to the poor sempstress; let thoughtful charity consider it, and soften the transition; but, in the end, she also will be the stronger and better for it, if she only keeps her own mind up with the times. If she sits sullenly down, and complains, or persists in making her fingers competitors of wheels and spindles, she will be crushed. There is less stitching to be done, that her faculties may be liberated for larger enterprizes, and her hands find a more exalted ministry. It is futile to be jealous of the laws of progression. Let us rather make them friends by conforming to them, and get them to back us up, by standing on their side. We must all go where the Almighty points, and not ask to have the orbs of celestial light stand still for our private accommodation. We must be hospitable and brave in our welcome of the new future, as well as thankful venerated of the old past.

So far, then, we have the place and office of the Hand. It has a school, a discipline and a dignity of its own. It is reconciled with all the mastery that man's best wits can wield. Its

skill, in any performance, shares the honors of the Brain. The handler is all; the things handled are alike. The wise handler of a hammer, trowel, axe, is as good as he that handles pen, or pencil, or lancet. The pitiful boaster of a pedigree of blood or titles — an ancestry that drove equipages rather than business, swung a dice-box instead of a sledge, and wore clothes as their vocation, finds his level. The Hand itself rises to the rank of a Reformer. It republicanizes the race. It directs toil by thought. It glorifies its muscles with the crowning mind. It points up, and declares that a man's head belongs just where Nature put it — on the top of his backbone!

II. Up, then, from Hands to Head. The hands administer; the head legislates. The hands perform; the head organizes. The hands execute; but it is the head still that originates, or invents. Anaxagoras was only half right; it is not the hand itself that constitutes man's superiority over other animals; but the hand as thought inspires it. The coming in of a new tide of intellectual life is always an epoch in the mechanics' profession; none feel it sooner than they. It exalts their whole estate, if they only welcome it, and raises them to a level with emperors. When Boulton, the engineer, partner of Watt, stood in the presence of George III., to open to him the mystery of the steam engine, and the king asked him, as he might a peddler, "What do you sell, sir?" Boulton replied, "What kings, sire, are all fond of — *power*." Worthy to be placed beside that was the heroic reply of the ingenious potter, Bernard Palissy, to the French monarch, after the massacre of St. Bartholomew. Charles IX. came to him in the Bastille, and told him if he did not give up his Protestant heresy he should be forced to surrender him to the persecutors. "Forced!" said the valiant Palissy, "they who force you cannot force me; I can die! Your whole people have not the power to compel a simple potter to bend his knee!"

The Saxons, it has been said, are the hands of mankind. But they are more than that. No hands ever smote, and grasped, and split, and builded, like theirs, that did not reach back, in their sinewy planting, to the top of the man, and get their motor forces straight from the imperial mandate there.

Now, to the realization of those results which science is in these days so liberally offering to industry, there must be a compliance with conditions — conditions requiring an earnest intellectual purpose in the individual, or else he fails of any but a very superficial advantage from the common excitement. The first of these is so simple a one as a division of time, and the consecration of hours to the Brain's private business. The notion that a man can get all the knowledge he needs for his business while his hands are busy at its details, is fatal to liberal achievements. That sluggish maxim never crowded your galleries with those trophies of triumphant wrestling-matches with Nature. Every species of work, that deserves to be done at all, deserves to be nurtured and enlivened from a higher fountain of inspiration than itself. Our capital-stock of ideas has to be replenished from another source than that where we keep our small coin in circulation. There must be a mine and a mint as well as a pocket purse and paying teller. Above the noisy streams of our outward activity are the cool head-waters of dispassionate thinking. However homely the drudgery of the employment, it has grandeur in it whenever it is followed by a workman who feels, at his daily return to it, that he steps forth out of a solitude where his intellect has been put to some strain. The common current of his transactions may look shallow or common-place; but it really borrows romance and sublimity from those heights of study whence his soul comes down into its round of commerce with the world. No great start forward was ever given to any practical art, except through

minds that kindled with this passion for knowing ; minds possessed by the love of knowledge for its own sake ; by the afflatus of a searching, inquisitive spirit ; by loyalty to the idea of a perfect life ; and all this taking form in systematic studies. One will not insist on the scientific avarice of the old scholar Buddæus, who said, at some expense of gallantry, that the only day he had utterly lost was the day he was married, because that day he "did only manage to get six hours for reading." But one can afford to let no ordinary and extra-matrimonial day dodge by him, without depositing in the hand of his persistent curiosity some piece of imperishable wisdom. It is yet to be popularly understood that the secret of recreation, after fatigue, is not idleness, but change of attention. After nearly all employments where the manual and observing faculties predominate, as in most mechanical and trafficking vocations, refreshment is reached by a fresh turn of thought far more effectually than by vacuity. When your mind needs rest, it does not need that you should empty yourself of your mind, and retire into a state of temporary brutism, or idiocy. If you need sleep, sleep outright. But this dozy, dreamy, soggy inertia, that stupefies so many busy men's evenings, dividing them with gossip and bad company, is not for the health of any part of us.

I allude to points so plain, gentlemen, out of a sincere sympathy, if I may not say loyalty, toward your vocation, as the masters of industry and machinery. You represent, nay, you are the men that are to manage the hands of the nation and the age. Whatever certain hereditary prejudices or prerogatives might prefer, men of your order, before this century is done, are to rise into more commanding posts than they have taken yet. The men of whom Franklin the type-setter was himself the type are not only to stand *before* kings, as he did, but *in the place* of kings. They are to sit on those thrones, Baconian and New-

tonian and Fultonian, of which nature is the foundation, and knowledge is the power. Daniel Webster said once, speaking of this very Society, Mechanics are the men that teach us how a little country is to be made a great one. But to that end, and in order that the power may not be reckless and demoniacal—the more of it the more mischief—these Hands must be guided and poised by wise and seeing heads. As I walk through your avenues of manufactures, and pause in section after section of exquisite and almost bewildering artizanship, this is the thought that ever recurs and haunts me: where are the thousands of mechanics that are not here, and have no share in this exhilarating competition? How to gain them over from their contented humdrum, and join them to this progressive company! For, remember, it is just as important that the many should be brought up with the few, as that the few should go on; and if you would find the one dividing line which separates the inventor and exhibitor from the plodding dullard, you must look for it in just that simple spot—that hour of solitary study, and of hard thinking, beyond the necessary circuit of the trade. The one is satisfied if he does to-day what he did yesterday, and as well. The other goes up, often, with prophetic aspiration, into a loftier atmosphere than that, and comes finally to lift his whole work with him, and live with the Olympian band.

And so, I say further, there must not only be set seasons of mental exercise, but there must be a determination to bring out the intellectual element that lies latent in every trade, and to know, of every piece of work, every thing that is to be known about it.

There are two ways of doing any business, from building empires to making pins. One is to succumb to the outward necessities of the task; to grind on as before, and get a living; to be dragged, with reluctant and abject moods, through the

wonted motions, with no elastic spring, no illumination, putting no mind into them. It is the testimony of the best practical observers among mechanics, I find, that familiarity with the details of any craft does not, by any means, dispose men to a study of its principles; but rather the contrary. And this is just what was to be expected; for it is so of every vocation under the sun. You will find in them all the plodder, the dunce, and the slave, on the one side; the vital, thinking, riddle-solving, discovering master, on the other. There are doctors that bleed and dose as mechanically as the sewing machine punches the stiches in the pillow-case. There are engineers as automatic as their engines. There are schoolmasters as regular, and hard, and smooth, and dry, as their ferules. There are preachers, — clerical grinders at the pulpit, — with whom, when the text lifts the gate, the mill-wheel begins sermon-wise to go. Those that fall under this torpid monotony miss the whole charm that God has woven about every honest pursuit. They go round and round, in the old servile track, with want for their overseer, custom for their cheerless cabin, and hunger and crying children for the whip and gong of the plantation. The deadening paralysis of repetition strikes in among their most thrilling concerns, dimming their splendor and spoiling their fascination.

The other way is to bring into every-day service so much mental activity, so much curiosity as to all the methods and mysteries of that kind of work, from the origin of the raw material up to the last result and highest finish of the product, that the workman may be said to hold his work under him while he does it, and maintain an honorable mastery over his trade. Master-workman, in this sense, which is the true sense, every workman can be — here, at least, in New England, where there is a schoolhouse in every district, and a library not far

off. Spiritual things apart, this is the foremost of all distinctions. Republicans ought to know of no other nobility. To be intellectually the commandant of one's place and calling, wheresoever — on ship's deck or at a factory-forge, in the cabinet of a nation's administration, or in the shop that makes cabinets for the people that make the administration — that is to belong to the senatorial order of men. This harnessing the whole intellect to the common business is blood and titles, stars and garters, sceptres and crowns. It is this that converts the job-mason, laying brick upon brick, into the artistic designer, that carries cathedrals in his brain. It is this that makes the difference to-day between the beggarly Mexican, scooping up precious minerals and metals by the shovel-full, and the affluent Yankee, digging through rock and ice, and all the tough resistances of the earth. It is this that turned all Boston, a week ago, into a pageant of grateful memorial for the boy that began with cutting the candle-wicks in his father's chandlery, and ended with laying the capstone of the temple of a nation's freedom, and electrifying every interest and every home in civilized lands with harmless fire from the skies. It is this that has borne on the slender southern orphan to be the pathfinder of a continent, the pioneer of the last great wilderness-exploration that the globe can require, the climber of the topmost peak of the continent, with his country's flag in his hand.

The least that intellectual honor challenges of every workman is that he aim to grasp and comprehend his own employment. But let him beware of half-notions as to the limits of that demand. *That* study reaches further, and will last longer, than a superficial glance would imagine. Be the employment what it will, it reaches forth, by some of its ramifications, into remote recesses of creation; it strikes its roots down among the secret facts of the world. No man can thoroughly educate

himself *into* his own business without being educated *above* it. I am not speaking of that perfunctory, outside knowledge, which is all that a majority of men ever get of their trade; just sufficient for a decent performance and an earning of bread; because it is between comparatively few men and their work, that a cordial intimacy, such as comes of interior knowledge, ever grows up. To extend that inquisitive class, is the ministry of all such associations as this — to make scientific Paul Prys, intense Yankee question-askers, bent on worming out all the domestic secrets of that cunning housekeeper, Nature. You will find, for instance, that a mason cannot thoroughly know masonry, without knowing the laws of architecture, the composition of the atmosphere and the effect of climatic changes on structures, the meteorology that subjects to science the draught of a chimney, the history of building, the principles of drawing, the significance of the orders. A really well-educated merchant will need to know political economy, to know statute-books, to know navigation and manufactures, to know physical and statistical geography, to know the principles as well as the current rates of exchange, to know the wants of many markets, and the languages of many countries, as well as to know men, and the manners that breed civility and conciliate success, in all countries, at the common court of honor.

Take a more minute department. If a silversmith will make a complete study of his work, travelling up, step by step, on the line of that single business, and not leaving the train of connected suggestions it opens, he will go first to the mine where the science of metallurgy confronts him; where also stands the mining art, with its engines, and water-wheels, and shafts, its blasting, and draining and extraction, with pulley, inclined plane, and hydraulics; the history of mining, too, running back into savage epochs, beyond Phœnicia and Tyre; the distribu-

tion of mines, and their implication in social problems, and their legal relations to surface-ownership, freehold and lease and rents. Then the science of mineralogy sets in, with its properties and classifications, its doctrines of form and composition, its branchings out into crystallography and optics, its acid, alkaline and neutral bases. This hands him over to geology, which will take him, if he will be taken, back through the dim beginnings of creation, among pre-Adamic periods and antediluvian formations, setting him against the rocky questions of cosmogony and interpretations of Genesis. Then, if he will turn back to the silver in his hand, he sees in that a white, malleable, tenacious substance, of which he has to learn — before he understands it — its specific gravity, the vitreous and black varieties of its ore, what metals it combines with, how it absorbs and gives out oxygen, is tarnished by sulphuretted hydrogen, takes on the appearance of granular crystallization, and may be alloyed with copper. Then, its manifold uses: how nitric acid gains from it lunar caustic for the surgeon to assuage pain, how simple mixtures with it produce indelible ink, how it is wrought into a thousand shapes of artistic beauty, to be ornaments for taste and gifts for friendship, and implements for use, to lie on bridal tables and glitter in the equipage of wealth; how it is cast into bullion, how it goes stamped as coin into all the circulations of commerce — takes the impress of character, gets pinched in the miser's grip, slips readily through the spendthrift's fingers, bribes guilt, and blesses poverty, runs into the contests of politics, affects currency, makes tedious speeches in Congress, and goes through all the channels of traffic and the pockets of men — and of women, too, they say, sometimes — mixing with and modifying all the deep tragedies and comedies of life, as they act their dramatic realities over the globe.

I give this, of course, only as an instance how the Brain, put in contact with only a special and limited department of work, stretches it up and down the ages, through the whole circle of the sciences, and even into the moral mysteries of the soul. Does the silversmith, sitting at his workbench, consider his calling?

You see how easy it would be to multiply these examples. The mind is an infinite and tireless traveller, out-voyaging Columbus or Cook, out-marching Audubon and Humboldt, out-watching Laplace, Herschel, telescopes, the stars themselves. Begin where you will, study will lead you out towards an ever-widening circumference. All truth is one. The sciences interlace their fibres. The smallest arc joins into a full majestic circle. Strike down where you stand, right under your feet, to investigate the commonest topic or fact, and, if you only keep on, the vein you hit will lead you to the end of the world, and over all the galleries of the centuries.

The practical point for us all is to escape contracted notions of our calling; to enliven and illuminate it by evoking its intellectual nobility; to be waked from the poor delusion that we *understand* our calling, only because we can respectably do some of its outside offices. The Brain asks more than this. It asks what has been done in it, and by whom; what is possible to be done in it, and by what means. So your standard of action is elevated by your knowledge, and, in turn, your expanding ideal stretches the actual performance. No housekeeper is fit to carry the keys who can be satisfied so long as there is better house-keeping done on the planet than between her four walls. So of the shoemaker, the railroad contractor, the blacksmith, the tailor. The mind's energy brings the whole average up, and equalizes every art to the possibilities of things. Thought and study grade the whole of life by the Alpine heights of its grander achievements.

Every solid human interest has successive stages in its progress, and every stage its wants. Mechanic art seems to me to have now reached that point where its chiefs and masters should look beyond the mere personal and financial result to the intellectual dignity and beauty involved; prized for their own sake. The true mechanician will ask not only how he may attain his mechanical object, at the least expense, and for the largest profit; he will have a sacred veneration for his art that will prompt him to give every piece of workmanship he finishes the highest perfection its nature suffers, regardless of any coarser recompense. There is an idea of thoroughness — an appetite for the best — a love of a perfect thing: the finish of the fabric, the polish of the blade, the grace of the machine — like what was seen in Jesse Ramsden's instruments. It is *not* the low lust of pay that crowds your exhibition-room with models. It is the passion for excellence, in itself — one of the noblest things in any man. It is the parent of intellectual enthusiasm. Just as there is a certain scientific ardor and an artist's delight in the higher examples of every learned profession, so in these popular avocations where science lends itself to the building of machines, and roads, and factories, there is a self-forgetful devotion to the completeness of the enterprise, which is the glory of the business. Some of the most thrilling passages in the annals of science and the arts — an honor to your profession and a light to us all — are records of such self-oblivious enthusiasm — the mortal body and its life quite bent under by the mighty ecstasy of the Brain; Pliny, pursuing his volcanic investigations to the crater's edge, and so the lover of Nature perishing in his eager watch for her Titanic throes; Anaxagoras, the astronomer, when rebuked for neglecting civic offices, replying, "My first care is for *my* country in yonder sky;" Eudoxus praying that he might approach the

splendor of the sun, though he should melt in its fervent heat; the youthful Malebranche taking up a volume of Descartes casually in a bookstore, and so excited as he read on that a palpitation of the heart obliged him to lay it aside; Sir John Franklin quite offering up the fleshly comfort to the all-commanding thought; Dante, going out to see a pageant in the city, but plunging into an abyss of contemplation in the street, profound as his own Inferno, where he saw no passing procession save the airy one of things invisible to mortal sight; Richardson, a printer's apprentice, stealing hours from sleep for reading, but scrupulously paying his employer for the candle by which he perpetrated that sinless theft; Rousseau, literally delirious with the first conception of the Treatise on Arts and Sciences; and Rittenhouse, the mathematical instrument-maker, and successor to Doctor Franklin as the President of the Philosophical Society, actually fainting with the intellectual agitation of observing, after long expectation, the transit of Venus across the disc of the sun.

Consecrations to the spirit of knowledge so disinterested and heroic as these exalt any vocation — none more than yours. They create a genuine nobility, independent of college diplomas or the patronage of wealth. They form a brotherhood of thinking Heads and working Hands, fit to be the reformers of mankind. Yet, that they may ascend to that purer eminence, another element of the threefold man must assert its place, superior still. And so we enter yet further and deeper into him, and find, at last, his Heart.

III. By the Heart I mean that central organ in man which unites him with his fellow-men, and so makes the best object of his acts and thoughts the welfare of his race. No mechanic, however ingenious the articles he fashions, is symmetrically developed, or educated, till he recognizes that bond. No work-

man, I hold, whatever his income, has true success, till, in all his labor and contrivance, he has respect for something wider and deeper than his own purse, or fame, or even the mere perfection of his workmanship; that is, for Humanity, Freedom, Truth and Right. And this he does with his Heart. The last earthly object of every useful art, and every ingenious invention, is to reach the vital springs of society, to ennoble its estate, purify its relationships and dignify its manners.

A striking proof of this is found in the fact that the appearance of original men has always been called for by peculiar social conditions — showing that God always values men more than abstractions, and the people more than institutions. Periods of intellectual activity have been times of heaving revolutions, of growing empires, of nascent commonwealths. Your own Association furnishes an instance, honorable enough to have mention any where. Its origin was essentially revolutionary. The energies that give it being were stung into activity by the Stamp Act and the Boston Port Bill. For it was just in the vigorous youth of the republic, under the bracing influence of the recent perils and struggles of the war — a war which their own sturdy sense and clear-sighted patriotism and strong right arms had helped most signally to carry to its proud result — that the mechanics of the town of Boston met at the old “Green Dragon,” to institute this very fraternity of industry and charity — sending abroad every year new mercies at home, and new inventions through the world. As a toast offered at a festival made by your Association thirty-one years ago, in honor of the visit of Lafayette, June 20, 1825, three days after the corner-stone was laid for the monument at Bunker Hill — so happily and dynamically expressed it: “Our revolutionary mechanics: their intelligence was the lever which upset the colonial government — their bravery the screw which kept

down the enemy — and their honor the pulley which lifted the country to independence.” Indeed, it is quite striking that the brilliant cluster of mechanicians that have given such progress and lustre to the mechanic arts in America were born or bred in this revolutionary period — Fitch, Evans, Fulton, Franklin, Slater, Whitney, Perkins, Whittemore, Eckford. Could we only look far enough down into the underlying harmonics of things, and read history from that point, we should see how human wants are the divinely commissioned begetters of all intellectual power. Before a great seer, or doer, or inventor is born, hidden causes, working in the bosom of God’s social family, require him. Every splendid discovery is wrung out of reluctant, inexhaustible Nature, at the cry of a mortal desire. Not more certainly is the planet built for man than every intellectual birth in it is a straight answer to his solicitation. So the religion of Judea and the Norse manhood — Love and Strength, or Heart and Will — met and married on the old Roman hearthstone, to generate a new line of ideas and of persons. Copernicus came to find the physical centre, just when the dawning truths of science began to demand that the axle-point of the heliocentric system should be fixed. The age of Raphael opened just when the rough lineaments of western civilization supplanted, inarticulately, the refining graces of Christian art. Every age, and every jubilee in it, every glorious and hallowed Sabbath, is made for man, not man for it. Columbus was but the finger of one crowded continent, feeling after room and rights in another — an industrial America to atone for military Europe — a missing hemisphere to finish the fragmentary globe. Lord Bacon was the answer of tired scholasticism, begging to get out of the labyrinth into a simple path. A hurrying century felt hindered in its restless emigrations, and Fulton came up to help it along. Busy and intimate and related and yet

widely divided nations ached for instant conversation, and Franklin found, and Morse equipped, the nimble medium that should be a tongue for all latitudes, talking face to face.

A thorough and principled confession of this vital relationship between personal progress and the good of society, appears to me one of the prime necessities of even our modern and American systems of industry and education. Take an example. If our fifty thousand educated heads, in America, were fifty thousand Christian hearts also, think you that for every one of them there would be five other intelligent persons, at least, in the nation, that wait for work, and can find no honest paying work to do? There is one problem. That here, in all New England, there should be no skill yet, no captain, no marshal, no engineer, to put so much idle capacity to some satisfying and fruitful labor, seems to me a dismal satire on our boasting; and that so few should be concerned about it, an intellectual crime. The age does not want mere manualists and functionaries, but whole-souled lovers of their kind. It does not want embalmers with their spices, but planters and Promethean lungs; not ideas plastered in pyramids and mausoleums, but moving in marts and throbbing with the pulsations of joy and love. And if these happen to be a little unlike the old fashions, have no fear of being called visionaries — so long as you see what you say — whether your neighbors see it, or blink it. See visions — it is the thinker's vocation; and turn them into facts — that is the workman's business. Dream dreams, and bring them to pass. Yonder exhibition rooms are full of such dreams brought to pass — embodied shapes of visionaries' silent reveries. Be hospitable to every faint, uncertain beam that straggles to your window. Who knows but it may travel from the skies, and have a sun on its track?

It comes to this: personal character, with altitude and breadth of manly stature, is the chief matter. Man is one with the species. If knowledge is to help society through him, it must only make him more entirely, largely, heartily, a man — disengaging every energy in his structure, teaching him at once the immensity of his trust, the completeness of his dependence, the wide openings for his wit, the possible splendors of his fate. To unbind the coarse clasp of poverty galling his affections; to emancipate him from the fear of mean masters jobbing with his conscience; to lead him out over the limitations of superstition humiliating his honor; to pacify those angry antagonisms that torture him with a perpetual terror of defeat; to abate the vulgar competitions that would make the holder of property a watch-dog over his heap; to wash out the vices that stain his soul, and animate the lethargy that benumbs his prayers; — this is surely the laborer's complete success.

Here, then, gentlemen, open upon us worthy objects for the ambition of the manly mechanics of a Christian age. These many centuries the mental character of the race has been slowly ripening towards this moral and social maturity. Oriental antiquity unfolded the theosophic instincts, and fed exploring fancies with fables of impossible adventures by impossible monsters. But the ascetic's creed, like the sand and rock of the deserts where it grew, discouraged industry, and the haughty dreamer treated the hungry serf with contempt. Grecian culture refined the perception of Beauty. But even from the golden tongue of Plato, and in the ears of Archytas, it ridiculed what it called the condescension of science to the business of improving machinery to lighten the handicrafts of laborers. Roman discipline marshalled the faculties of man under that stern Duumvirate of the Will and the Talent for empire. But "the finding out of things useful," Seneca was

silly enough to say, "is not the work of a philosopher, but drudgery for slaves." The valor of the North has battled for ancestral privilege, and hereditary national renown. And now the rising Genius of the West appears, to be called to a more exalted ministry yet. If it has stooped a little to gather the material jewels scattered so prodigally at its feet, let that be pardoned to the impetuosity of a young nation's blood, and the pressure of the temptation. Its true destiny is to emancipate and to bear forward the whole oppressed and obstructed life of man into its due liberty and victory. When the banner of the republic was unfurled from a rifle ramrod on the icy peak of the Rocky Mountains, by one of the bravest sons of science, it was not merely a conquest of physical adventure; it was a type of our national enterprise, a prophecy of the part we have to play in rearing the great Home of equality and freedom for social man. Every mechanic has a personal interest in that peaceful capture of the wilderness — that splendid symbol of the final subjection of the empire of Nature, in her vast and most imperial solitudes, to the empire of man in the might of his Hand and Brain and Heart. The ocean to which those subjugated mountains look off — that globe-completing sea, on whose shores the last and grandest act in the world's unfolding drama is to be displayed, is the PACIFIC; name of hope, of promise, of consolation, to the weary and warring and westward-looking tribes of men!

In the settlement of those social problems which now agitate and threaten, I believe that an intelligent industry has more to do than many people have imagined. The poverty of our great cities — the terrible idleness and consequent degradation of woman, inequality between work and wages, between capital and labor, slavery — all these involve questions which you help to settle, just so far as you inform workingmen with just ideas

of their work, and refine the people with intelligence. That may happen again, in substance, which happened in the reign of Edward, when the introduction of woollen manufactures into England lifted up the serfs of feudalism, and a new order of self-respecting laborers was installed in British society. Open such a display of the fruits of industry as now adorns Market street in every city of the slaveholding States, and it would do more than ten thousand platform harangues to break the bondman's chains. Plant the power that your machinists know how to gear along the water-courses of the South, send a few Brindleys, Slaters, Storrows, Lawrences, Olivers, Winchesters, as missionaries among them, and you would make emancipation as much the interest of the master as the joy of the slave. In fact, I regard your Mechanics' Charitable Association as a sort of practical anti-slavery society — quietly *working out* the demonstration which so many tongues are *talking at*.

Be assured, new greatness awaits thinking and working men, when they shall look beyond private promotion, and make these humane enterprises their immediate concern. The preamble of your Constitution contains an explicit recognition of that truth. Take Philosophy: Is it not in the nature of things that her very soul should expand — for she has a soul — when she turns her discoveries into treasures of mercy, and then scatters them by the waysides of common hardship, at the doors of the poor, or where the children of men grow faint, and pale, and thin, with unrewarded toil? The Arts: Can they help springing into more vigorous activity, when they feel themselves to be like angel hands, beckoning up, with their bright fingers, the neglected and debased to honorable places in the great family mansion of Christendom — a reinstated line of heroes and kings brought back from their banishment of ignorance and crime? Commerce must appear a science of broader scope than the bloody

cruises of the days of Elizabeth or the avaricious merchandise of money-loving moderns have made it, when glorious expeditions of brotherly kindness chase each other into the Arctic ice, each eager to shelter its predecessor from the perils of polar night and frost — when fleets of mercy wing their flight from shores of plenty and health to starving lands and pestilential cities — when peaceful navies fill their ribs with mutual blessings, mails, missionaries — and navigation is no longer the angry armor-bearer of appetite, but the friendly cup-bearer of Christian charity, from port to port, in the great festival of the climates. Knowledge needs only to let the heart beat in its breast — to be what Humanity asks of it — not a sallow monk, dreaming in a clammy cave; not a selfish Sybarite, gloating over its dish of delicious reputation; not a paramour, dallying with the passions; not a respectable servant-in-waiting, keeping the door of pompous patrons; not a mystic dervise, gazing complacently at its own interiors — but the breathing, sympathizing broad-shouldered and whole-souled benefactor of the people. Under an education of industry truly catholic as this, publishing glad tidings with beautiful feet upon the mountains and in city streets, places that the old civilization left barren with bitter tears, shall be fruitful as Carmel, and the real golden age, not classical but Christian, be installed with a general Pentecost of love.

There is a glorious possibility, which has sometimes haunted the dreams of thinkers, at whose grandeur all common hopes of scholars kneel with veneration. It is the unity of all sciences — arts, labors, letters — under one all-embracing and connecting principle, or law. If that majestic idea shall ever be realized, what shall be the one unifying truth? What girdle shall be vast enough to encircle all knowledge? What principle shall be comprehensive enough to contain all systems,

schools, discoveries, conclusions — clasping into its starry belt all the constellations of human thought? I answer, it is no other, it can be no other, than the Brotherhood of men, beneath the Fatherhood of God.

I remember, gentlemen, that one significant and gracious term in the title by which you are so honorably known is “Charitable!” What an undertone of Christian melody that soft word, charity, breathes through all the rough collisions of the shop and the market, all the conflict of the Hands, and the contriving of the Brain! It speaks of the hallowed amenities of home, where delicate tastes assemble, and simple pleasures breed content; of the workman’s genial evening, after the working-day is over, where music, and woman, and childhood, refine the out-of-door roughness with peace and purity; and where man learns to scorn the vulgar calculation which would rob the familiar household of graceful courtesies, to pay them all away in politic politeness to the customer at the shop. It speaks of the conciliating influence of such jubilees as this you are holding, bringing kindred faces together, healing jealousies and cooling the fever of rivalries, wakening a generous goodwill, melting misunderstandings, creating a common spirit. It speaks of pity for the needy neighbor, who has gone down, overborne in the fierce competition or calamity of life, and of sorrow for the tempted one, falling by the way — of the magnanimity that rescues Hunger from despair — of the liberality that leads the widow and the orphan gently. Every benevolent cause has a fuller treasury for the large-hearted mechanic’s bounty; all good learning, a servant and a patron in his munificence; the church an unostentatious worshipper, and a sincere defender against time-serving, hypocrisy and cowardice, in his believing confession and his godly life.

So, then, my three-fold theme completes its circuit. Hands, Head, Heart. In the consummate kingdom of a man, the Hands are offices of departments; the Head is the hall of legislation, the Heart is the holy of holies. In the personal administration, the Hands are the executive; the Brain is the lawgiver; the Heart is the prophet of God. The Hands perform, accomplish, do; the Head designs, organizes, shapes; the Heart inspires, ennobles, humanizes. A man is wide with his hands, high with his head, but deep with his heart. For the Hands you look *out*, for the Head *up*, for the Heart *in*. Grand and witty forces as brain and fingers are, the heart is a grander strength, and rules by a diviner right. All valor and goodness are by that. For into that descends, if only the door of faith stands open, the spirit of the Holy One, Fountain of all light and purity and power.

Here, then, my fellow-laborers and fellow-students, is our present task, and our future way. Standing here on this eastern and original shore of the westward-opening country, it is our part to aim at liberal, rational, fraternal forms of social life. All the omens and conditions favor us. They point to the expanding cluster of growing commonwealths. In that august American crucible where the Divine Chemist is pouring the mixtures of the earth's elder bloods, to yield a fair, and, Heaven grant, a lasting sway of justice and love, there must be a contribution, and yet a correction, of every stock that has flourished under the sun: the strong heart of the Saxon, without his bloody hand — the graceful loyalty of the Norman, without his levity and pride — the bravery of the Celt, without his impudent ferocity — the iron will of the *Senatus Populusque Romanus*, without the audacity of its ambition and the cruelty of its eagles — the airy ingenuity of the Greek, divorced from the worship of the senses — the reverence of the Hebrew, cleared

of his narrow nationality — and the heaven-piercing gaze of Chaldea and Shinar, without their superstition — looking above all the stars of science, and the differing glories of their devotees, to Him who walketh in the midst of the seven golden candlesticks, and holdeth the stars in his right hand.

With such aims and convictions as these, there is no destiny too auspicious for the land. Learning would become the preceptor of industry, the crown of enterprise, the ornament of the republic, a minister of the church. Art, handmaid of religion, science, elevator of humanity, literature, the voice of experience, and labor, the body of thought, would combine their constructive offices for rearing the open temple of our life. And in building that sanctuary, hands, brain and heart, our Artificer, Designer and Prophet, should do all things after the pattern shown them in the Mount — the Mount of the adoration and vision of God!

